Portuguese scientists working on chromosome segregation

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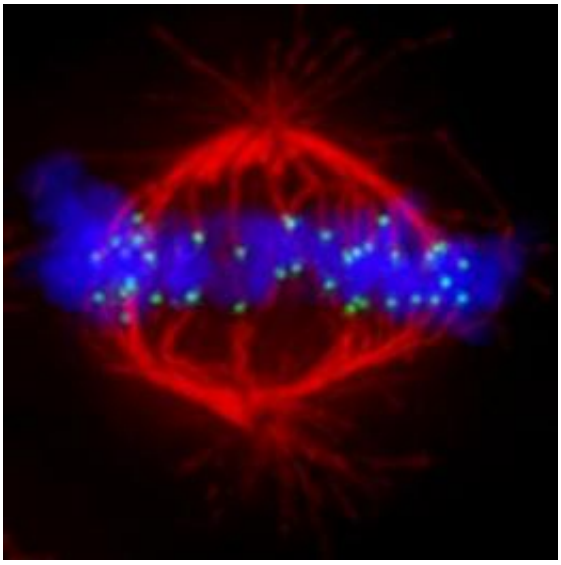


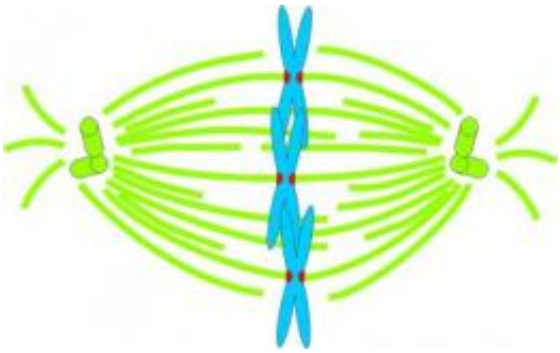
A cell seen through a microscope: the chromosomes (in blue) are attached to the microtubule tracks (in red) in the region of the centromere -- green spots mark the protein CENP-A on the centromere. Credit: Lars Jansen (IGC)

Lars Jansen's work on the formation of the centromere, a key cellular structure in powering and controlling chromosome segregation and accurate cell division, has just earned him a paper in *Nature Cell Biology* and a prestigious EMBO installation grant, of 50,000 euro per year.

Lars Jansen moved from California to the Instituto Gulbenkian de Ciência (IGC), in Portugal, last year to head the Epigenetic Mechanisms

group. The Nature Cell Biology paper, published online this week, in collaboration with a group at Stanford University School of Medicine, provides new insights into the scaffold of proteins that ensures accurate segregation of chromosomes during cell division - a fundamental step to ensure that daughter cells have the same genetic information as their mother, with reduced risk of cancer.

When segregating, chromosomes attach and move along proteins tracks (the mitotic spindle), from the centre of the cell to the poles. The centromere is the area of the chromosome that directs this attachment by controlling the assembly of a scaffold of proteins (called the kinetochore), which tether the chromosome to the spindle, and power its movement along the protein track. The location of the centromere on the chromosome is marked by the presence of a protein, called CENP-A, but how this protein is recognised by the other components of the cell to orchestrate the assembly of the centromere was not understood - until now.



This is a cartoon showing the chromosomes in a cell (blue) attached to the microtubule tracks (in green) through the kinetochore (in red). Credit: Mariana Silva (IGC)

Using a newly developed assay, Lars and his colleagues were able to

identify the protein that triggers the assembly of the centromere. It's called CENP-N. According to Mariana Silva, a PhD student in the lab, 'When we depleted CENP-N in cells, the centromere did not assemble correctly and chromosomes segregated abnormally, leading to situations similar to cancer'.

This study, the first paper from Lars and his PhD student Mariana since arriving at the IGC a year ago, proves the applicability of this new assay and open doors to future studies into centromere assembly and structure. Indeed, Lars' proposal to further explore centromere assembly and function, was awarded an EMBO installation grant and entrance into the prestigious network of some of Europe's best young group leaders.

According to Lars, the award "will be a huge boost to our research! Apart from the direct monetary benefit this grant is a great recognition of the relevance of our work and the science we propose in this project. Moreover, entry into the EMBO Young Investigator Programme allows me to fully integrate our emerging laboratory in the larger European scientific community. The IGC has been extremely supportive of our efforts and remains critically important in creating the conditions that help our laboratory and work to come to full fruition."

Source: Instituto Gulbenkian de Ciencia (news : web)